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Dr. Paul V. Braun
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at Urbana-Champaign

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3:15 Reception
3:30 Seminar
112 Hamilton Hall



“Three Dimensionally Structured Materials for Energy Storage and Light Harvesting”

Over the past decade, the sophistication of self and directed-assembly approaches for functional composite structures has increased dramatically; however, application of such structures in real-world systems has remained largely elusive, in part because such structures almost always contain finite defect densities. The storing, generating and harvesting of photons and electrons presents a unique opportunity for self-assembled composite materials. These applications are not only generally much more defect tolerant than for example self-assembled computational electronics, but also for these areas to make a substantive impact on the world energy situation, they must be produced in exceptionally large volume. In my talk, I will attempt to capture the state-of-the-art in highly functional self-assembled three-dimensional composites for energy harvesting and storage illustrated with examples from both my research and other groups with a particular focus on high charge and discharge rate nanostructured electrochemical energy storage systems (batteries and supercapacitors), and photonic crystals which exhibit unprecedented control over the absorption and emission of light (lasers, LEDs, and solar cells).